

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (U.S. Patent Number 5,932,990) and further in view of Baldwin et al. (U.S. Patent Number 6,583,603).

3. Claim 1: Kaneko teaches a DC power supply apparatus (4); a load device (3); a lithium ion battery (1a – 1n) for backup that is connected in parallel with said DC power supply apparatus and said load device (Fig.1); a charging path; a switch (2) that disconnects said lithium ion battery from said load device, or connects said lithium ion battery to said load device (Col.4, Lines 38-40).

Kaneko does not explicitly teach a charging current limiting circuit that is connected in series with said lithium ion battery and supplies a charging current of an arbitrary value independent of load fluctuations in the charging path of the lithium ion battery; and a control circuit that monitors the voltage value of said charging path, sets a reference voltage setting used for setting the charging current of an arbitrary value in said charging current limiting circuit, and controls said switch when said voltage of said charging path exceeds a specified voltage value during charging.

Baldwin teaches a charging current limiting circuit that is connected in series with a battery and supplies a charging current of an arbitrary value independent of load fluctuations in the charging path of the lithium ion battery; and a control circuit that monitors the voltage value of said charging path, sets a reference voltage setting used for setting the charging current of an arbitrary value in said charging current limiting circuit (Col.9, Lines 3-10), and controls said switch when said voltage of said charging path exceeds a specified voltage value during charging (Col.10, Lines 44-48) (Col.4, Lines 42-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have had the teachings of Baldwin in the device of Kaneko to have prevented the battery from receiving damaging excess recharge current levels (Col.9, Lines 6-10) and for isolating the battery from load and the primary power supply (Abstract).

4. Claim 2: Kaneko and Baldwin teach the limitations of claim 1 as discussed above. Kaneko teaches a plurality of said lithium ion batteries are connected in series (Col.4, Lines 32-36), and said power supply system is further provided with a voltage regulation circuit (13) that is connected in parallel with each lithium ion battery of said plurality of series-connected lithium ion batteries (Col.4, Lines 64-67) (Col.5, Lines 1-3), detects a full-charge voltage in each of said lithium ion batteries and bypasses said charging current (Col.4, Lines 55-63).

5. Claim 3: Kaneko teaches a DC power supply apparatus (4); a load device (3); a lithium ion battery (1a – 1n) for backup that is connected in parallel with said DC

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power supply apparatus and said load device (Fig.1); a charging path; a switch (2) that disconnects said lithium ion battery from said load device, or connects said lithium ion battery to said load device (Col.4, Lines 38-40); a voltage regulation circuit (13) that is connected in parallel with each lithium ion battery of said plurality of series-connected lithium ion batteries (Col.4, Lines 64-67) (Col.5, Lines 1-3), detects a full-charge voltage in each of said lithium ion batteries and bypasses said charging current (Col.4, Lines 55-63).

Kaneko does not explicitly teach a charging current limiting circuit that is connected in series with said lithium ion battery and supplies a charging current of an arbitrary value independent of load fluctuations in the charging path of the lithium ion battery; and a control circuit that monitors the voltage value of said charging path, sets a reference voltage setting used for setting the charging current of an arbitrary value in said charging current limiting circuit, and controls said switch when said voltage of said charging path exceeds a specified voltage value during charging.

Baldwin teaches a charging current limiting circuit that is connected in series with a battery and supplies a charging current of an arbitrary value independent of load fluctuations in the charging path of the lithium ion battery; and a control circuit that monitors the voltage value of said charging path, sets a reference voltage setting used for setting the charging current of an arbitrary value in said charging current limiting circuit (Col.9, Lines 3-10), and controls said switch when said voltage of said charging path exceeds a specified voltage value during charging (Col.10, Lines 44-48) (Col.4, Lines 42-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have had the teachings of Baldwin in the device of Kaneko to have prevented the battery from receiving damaging excess recharge current levels (Col.9, Lines 6-10) and for isolating the battery from load and the primary power supply (Abstract).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHALI A. TORRES RUIZ whose telephone number is (571)270-1262. The examiner can normally be reached on M- Alternating F 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Akm Ullah can be reached on (571) 272-2361. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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